

## 1.2 Polynomial Identities & Factoring

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

**Expand the product using polynomial identities. Show work!**

1.  $(x-2)(x+5)$

2.  $(3x-5)(x+2)$

3.  $(3x-y)(3x+y)$

4.  $(3-5x)^2$

5.  $(3x+4y)^2$

6.  $(2u-v)^3$

7.  $(u+3v)^3$

8.  $(2x^3-3y)(2x^3+3y)$

9.  $(\sqrt{u}+\sqrt{v})(\sqrt{u}-\sqrt{v})$

10.  $(x^2-\sqrt{3})(x^2+\sqrt{3})$

11.  $(x-2)(x^2+2x+4)$

12.  $(x+1)(x^2-x+1)$

**Factor each expression. Show work!**

13.  $25x^3 - 30x^2$

14.  $-3y^3 - 9y^5 + 21y^6x^3$

15.  $x^2 + 7x - 8$

16.  $x^2 - 5x + 6$

17.  $x^2 - 3x - 12$

18.  $2r^2 + 21r + 40$

19.  $15x^2 - 14x - 8$

20.  $3n^2 + 28n + 60$

21.  $4x^2 - 20x + 25$

22.  $9n^2 + 26n + 100$

23.  $x^2 - 25$

24.  $16x^2 - 49$

25.  $25x^2 + 16$

26.  $81 - 49x^2$

27.  $2x^2 - 32$

28.  $x^3 + 125$

29.  $27x^3 - 1$

30.  $x^3 - 216y^3$

31.  $125x^3 + 27y^3$

32.  $7k^3 - 21k^2 + 5k - 15$

33.  $5x^3 + 2x^2 - 15x - 6$

34.  $2p^3 + 6p^2 + p + 3$

35.  $3k^2 - 24k - 60$

36.  $x^3 + 13x^2 + 42x$

37.  $36xy + 48x - 6ky - 8k$

38.  $6n^3 - 3n^2$

39.  $3k^2 - 19k - 20$

40.  $25a^2 + 30a - 135$

41.  $20x^2 - 70xy$

42.  $m^2 - 24m + 144$

43.  $121n^2 - 4$

44.  $32a^2 - 18b^2$

45.  $9m^2 + 6mn + n^2$

46.  $3x^6 + 24$

47.  $1 - 125x^6$

48.  $64x^6 + 1$

Solve each of the following (find the zeros). Leave answers as fractions.

49.  $x^2 - x - 90 = 0$

50.  $15x^2 - 16x = -4$

51.  $3x^2 - 12x = 0$

52.  $4x^2 + 46x + 90 = 0$

53.  $2x^2 - 20x = -50$

54.  $5x^2 + 10x = 0$

55.  $6x^3 + 3x^2 - 8x - 4 = 0$

56.  $x^2 - 100 = 0$

**Use the quadratic formula to find the exact answer in simplest form for each equation. Show work!**

57.  $x^2 - 5x - 7 = 0$

58.  $3x^2 - 4x + 3 = 0$